



## TERAHERTZ SPECTROSCOPY AS ANALYTICAL TOOL IN PHARMACETICAL

Vaishnavi Thakur, Sushma Rathod

SGSPS Institute of Pharmacy, Kaulkhed Akola

### ABSTRACT:

Terahertz spectroscopy and imaging techniques have advanced the chemical and physical characterisation of active pharmaceutical ingredients (APIs), excipients and final solid dosage forms. Terahertz radiation can be used to investigate both chemical and solid structures, as well as provide information on the bulk morphology of pharmaceutical materials. The penetrating and non-destructive properties of terahertz light, coupled with its high acquisition rate, makes this technology a promising candidate for process analytical technology (PAT) applications. Nowadays terahertz spectroscopy is a well-established technique and recent progresses in technology demonstrated that this new technique is useful for both fundamental research and industrial applications. Varieties of applications such as imaging, non destructive testing, quality control are about to be transferred to industry supported by permanent improvements from basic research. Since chemometrics is today routinely applied to IR spectroscopy, we discuss in this paper the advantages of using chemometrics in the framework of terahertz spectroscopy. Different analytical procedures are illustrates. We conclude that advanced data processing is the key point to validate routine terahertz spectroscopy as a new reliable analytical technique. By measuring in the time-domain, the technique can provide more information than conventional Fourier-transform spectroscopy, which is only sensitive to the amplitude. Since the time-domain, and consequently the frequency-domain, of the THz signal is available, the distorting effect of the diffraction can be mitigated and the resolution of the THz images can be enhanced substantially.

**KEY WORDS:** Terahertz spectroscopy, imaging techniques, chemical and physical characterization.

**Corresponding Author:** Vaishnavi Thakur

Indian Research Journal of Pharmacy and Science; 19(2018)1772;  
Journal Home Page: <https://www.irjps.in>